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Subsaharan Ceratopogonidae (Diptera) XIV. New species and records of *Forcipomyia* and *Dasyhelea*, mainly from Zimbabwe and Transvaal, South Africa

by

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Study of recent collections of Subsaharan Ceratopogonidae of the subfamilies Forcipomyiinae and Dasyheleinae has yielded records of 25 new or poorly-known species, with the following described as new: *Forcipomyia consortis*, *F. furfura*, *F. gokwe*, *F. guttata*, *F. haroldi*, *F. watshami*, *Dasyhelea atra*, *D. columna*, *D. forficata*, *D. furcula*, *D. hamata* and *D. imperfecta*.

INTRODUCTION

This paper is the fourteenth in a series of reports describing new genera and species of biting midges from Africa south of the Sahara. In the present study we report on species of two subfamilies, Forcipomyiinae and Dasyheleinae, mainly on a series of collections sent to us from Zimbabwe and the Transvaal, South Africa. Species of the subfamily Ceratopogoninae will be reported in a separate paper.

The systematic arrangement used here follows that given in the Afrotropical catalogue by Wirth *et al.* (1980). Keys to genera may be found in Wirth *et al.* (1974, 1977). Explanation of the taxonomic characters used can be found in the general papers on Ceratopogonidae by Wirth (1952), Wirth *et al.* (1977) and Downes & Wirth (1981). Holotypes and allotypes of new species are deposited in the South African Institute for Medical Research, Johannesburg. Paratypes, whenever available, are deposited in the British Museum (Natural History), London; the Natal Museum, Pietermaritzburg; and the National Museum of Natural History, Smithsonian Institution, Washington DC, USA.

Subfamily FORCIPOMYIINAE

Genus *FORCIPOMYIA* Meigen

The African species of *Forcipomyia* were monographed by Dessart (1963) who provided keys, illustrations and diagnoses of species.

Forcipomyia (Caloforcipomyia) campanula de Meillon & Downes, Fig. 1.

Forcipomyia (Caloforcipomyia) campanula de Meillon & Downes, 1986: 142.

MATERIAL EXAMINED: New record. SOUTH AFRICA: Transvaal, Die Tuine, Tzaneen, 22.xi.1983, M. Coetzee, UV light trap, 1 ♂, 2 ♀.

Described originally from Cathedral Peak, Natal, the species has since been collected several times. A point that has not been stressed concerning the female is the sclerotization of the whole of the 8th segment and the great development of the 9th tergum (Fig. 1). This results in downward pressure on the cerci causing them to appear somewhat pendulous.

Forcipomyia (Euprojoannisia) avocadonis de Meillon & Wirth, Figs 2–9.

Forcipomyia (Euprojoannisia) avocadonis de Meillon & Wirth, 1979: 188.

This species was originally described from a single male taken at flowers of avocado (*Persea americana*) at Farm Glen Allen, Tzaneen, Transvaal. Capture of additional males and an accompanying female near the type locality provides the opportunity to describe the female and redescribe the male.

MALE. Wing length 1,2 mm. Head. Black with paler mouthparts; eyes bare, with wedge-shaped separation, at its narrowest separated by 1 facet and 6 or more at its widest. Antenna with dense black plume; segment 3 slightly swollen subbasally, 4–11 slightly wider than long, 12–15 elongate with lengths in proportion of 30–19–11–15 including a papilla of about 2 units; antennal ratio (segments 12–15/3–11) 1,00. Palpus 5-segmented, segments 4 and 5 more or less fused; segment 3 (Fig. 3) slightly swollen in midportion where it bears a shallow but distinct sensory organ. Proboscis fairly long and the palpi just surpass it; labrum fringed apically.

Thorax. Black; pleuron and scutellum a shade paler; latter with about 10 long setae and a few smaller ones. Wing densely covered with macrotrichia, microtrichia minute appearing mainly as small dots; costal ratio 0,4; 1st radial cell undeveloped, 2nd small and open. Legs brown throughout, hairy, without scales; hind tibia with subapical comb of about 12 short but strong teeth and apical row of 6–7 long subequal setae; apical spur slightly curved, strong and spinelike, about as long as apical width of tibia. Mid tibia with a group of long strong setae apically; fore tibia with a short apical comb of very fine but long, closely set teeth difficult to see, and an apical spur as on hind leg; tarsal ratios of fore, mid and hind legs are 1,6, 1,2 and 1,0; claws quite long, simple and not split terminally; empodium well developed.

Abdomen. In colour much as thorax but slightly paler. Genitalia (Figs 4–6, 8–9) not strongly sclerotized, typical of the subgenus; 9th sternum broad, distal margin slightly convex medially; 9th tergum largely transparent and without any enlarged apicolaterals (Fig. 4); basistyle slightly less than twice as long as wide basally, enlarged on its inner basal margin where it bears a short spine-like seta slightly thicker than normal; dististyle (Fig. 9) as usually seen in the subgenus, short and stumpy; aedeagus

(Fig. 5) with a ventral part (shaded in Figs 5–6), and a posterior part consisting of 2 transparent and difficult to see projections, 1 on each side of the ventral plate as shown in Fig. 5; basistylar apodemes joined in a loop typical of the subgenus as shown in Fig. 4, or narrowly separated as in Fig. 8.

FEMALE. Wing length 0,9 mm. The single female described here was taken with the males at the same time and place. It is typical of the subgenus and resembles the male closely. Only characters differing from those of the male are emphasized.

Head. Mandible with many small dark teeth. Antennal segments 4–10 subglobular, 11–14 somewhat vasiform, subequal, each nearly 3 times as long as wide basally, 15 slightly ovoid, about 3 times as long as wide with a prominent apical papilla; 10–15 with lengths in proportion of 11–19–19–19–19–19 plus a papilla of 3 units; antennal ratio (segments 11–15/3–10) 1,2. Palpus (Fig. 2) with 3rd segment longer, slightly expanded, with sensory pit more pronounced than in male.

Thorax. Wing with costal ratio 0,48; 2 radial cells, 1st narrow, 2nd as in male. Tarsal ratios of fore, mid and hind legs are 2,0, 1,7, and 1,4.

Abdomen. Spermatheca (Fig. 7) single with a wide neck as figured, measuring in width 0,057 mm, partially collapsed and length not measured, but probably slightly more than width as typical of species described by Bystrak & Wirth (1978).

MATERIAL EXAMINED: SOUTH AFRICA: Transvaal, Silver Leaves, Tzaneen, 18.vii–11.ix.1984, M. Klapwyk, in Cross emergence trap, 4 ♂, 1 ♀.

The species is typical of the subgenus as described by Bystrak & Wirth (1978). It is easily separable from other Subsaharan species by the structure of the aedeagus. The female is very much like that of *F. vernocheti* (Clastrier 1959) from Réunion (of which the male is unknown), especially in having only a single spermatheca of comparable size and shape. In that species, however, the wing length is 1,2 mm, the 1st radial cell is poorly developed and the tarsal ratios are 1,9, 1,3 and 1,3.

Forcipomyia (Euprojoannisia) mopsus de Meillon & Hardy.

Forcipomyia mopsus de Meillon & Hardy, 1954: 71.

MATERIAL EXAMINED: SOUTH AFRICA: Eastern Cape Province, Knysna and Stormsrivier, 10–30.xii.1981, S. & J. Peck, 2 ♂, 1 ♀.

In the catalogue of the Afrotropical Ceratopogonidae (Wirth *et al.*, 1980) this species was placed in the subgenus *Lasiohelea*. A re-examination of the type material, which agrees in all respects with the present specimens, shows that the species belongs in the subgenus *Euprojoannisia*.

Forcipomyia (Forcipomyia) castanea (Walker), Figs 10–15.

Ceratopogon castaneus Walker, 1848: 26.
Ceratopogon (Forcipomyia) castaneus Walker; Austen 1912: 106.
Forcipomyia castanea (Walker); Ingram & Macfie 1924: 546.
Forcipomyia (Forcipomyia) castanea (Walker); Dessart 1963: 52.

DISTRIBUTION. Gambia, Ghana, Nigeria, Senegal, Sierra Leone.

MATERIAL EXAMINED: New record. ZIMBABWE: Harare, St. Ignatius College, A. Watsham, light trap, 3 ♂.

A medium-size species (wing length 1,3 mm) with black mesonotum, pale pleuron, pale abdomen with narrow, apically black-banded terga; legs largely pale but hind femur with a definite dark band just past midlength (Fig. 12); tarsal ratios of fore, mid and hind legs are 0,83, 0,63 and 0,64. Abdomen of male pale, terga laterally and dorsally with dark brown markings as in Fig. 13. Genitalia (Figs 10, 14–15) as follows: aedeagus (Fig. 14) with apex of sclerotized portion truncated, the pointed tip hyaline and poorly visible; parameres (Fig. 10) joined on basal half, each a long, slender, sharply pointed process, and between them a fine spine-like extension of the fused portion; in Fig. 10 the parameres are shown in dorsal view *in situ* overlaying the aedeagus; dististyle (Fig. 15) infuscated apically. The female wing has dark brown macrotrichia with a small yellowish spot at end of the costa, while the male wing has pale macrotrichia except for a small dark spot just past end of costa.

Forcipomyia (Forcipomyia) guttata sp. nov., Figs 16–21.

A striking species with black mesonotum, pale pleuron, pale abdomen with apicolateral triangular dark spots and spotted tibiae; without scales.

MALE. Wing length 1,0–1,2 mm. Head. Black, mouthparts and antenna a shade paler. Eyes narrowly separated, bare. Antenna with segments 7–10 fused; plume well developed, brownish; lengths of segments 11–15 in proportion (mean lengths with range in brackets, of 4 specimens) 19(18–20) – 60(58–62) – 46(43–50) – 30(27–33) – 37(31–40); antennal ratio 1,10(1,04–1,19). Palpus (Figs 18–19) 5-segmented; 3rd segment swollen at base, slightly longer than segments 4 + 5, bearing a sensory pit; in side view (Fig. 18) 3rd segment appears to be swollen basally on 1 side only, but in ventral view (Fig. 19) it is seen to be evenly swollen.

Thorax. Mesonotum, postnotum and scutellum black, latter with about 8 long strong setae and some 15 shorter ones; pleuron pale and contrasting sharply with mesonotum. Wing densely clothed with black macrotrichia, slightly denser over costa; 2nd radial cell open; mean costal ratio and range in 3 specimens, 0,37(0,36–0,38). Legs pale with posterior margins of all tibiae marked with conspicuous black spots bearing long, strong bristles (Fig. 21); these spots somewhat variable in size and number, a count on the legs of 5 specimens gave the following: fore tibia 2–3, mid tibia 3–4, hind tibia 3–4; spots on hind tibia more pronounced; all tarsi pale throughout with short dark setae and spines; mean tarsal ratios in 4 specimens with ranges in brackets are: fore leg 0,88(0,84–0,94), mid leg 0,58(0,52–0,65), hind leg 0,65(0,64–0,67); claws long, slender and strongly curved.

Abdomen. Pale as pleuron with apicolateral triangular dark spots bearing long strong setae. Genitalia (Figs 16–17) very poorly sclerotized (staining was necessary for study); 9th sternum with distal margin straight or with shallow concavity; 9th tergum with rather blunt, stumpy apicolateral processes; basistyle darkened on basal half or less, without any striking features; dististyle as in Fig. 17, gradually narrowing to apex; aedeagus entirely transparent except for short basal arms, shield-shaped as in *F. furfura* sp. nov.; parameres (Fig. 16) appear to be separate (observation questionable), but touching one another medially over a short distance as shown in figure.

FEMALE. Apart from sexual differences and uniformly dark wing and abdomen, the female resembles the male closely in external appearance; only the differences are noted. Antennal segments 11–15 with lengths in proportion of 5–5–5–5–7 including a pronounced papilla on 15; antennal ratio 0,79. Palpus (Fig. 20) as in male but base of 3rd segment more swollen and sensory pit more distinct. Spermathecae 2, oval, heavily sclerotized; without necks; measuring 0,073 × 0,052 mm and 0,065 × 0,047 mm. Genital sclerotization inconspicuous.

MATERIAL EXAMINED: Holotype ♂, allotype ♀, 6 ♂, 1 ♀ paratypes. ZIMBABWE: Harare, St. Ignatius College, ix–x.1984, xii.1985, i–ii.1986, A. Watsham, light trap.

The speckled tibiae and the parameres which touch one another a short distance on the internal margins, serve to distinguish *F. guttata*. The species is similar in appearance to the Neotropical species *F. pictoni* Macfie (1938) and to *F. punctipes* Edwards (1928) described from Samoa and recorded by Macfie (1934) from Malaysia. *F. guttata* can be readily distinguished from the following species, *F. furfura*, by the lack of black lanceolate scales, less prominent tibial spots, more slender 3rd palpal segment, and lower tarsal ratios.

Forcipomyia (Forcipomyia) furfura sp. nov., Figs 22–24.

A striking species with tibiae more prominently spotted than in *F. guttata* sp. nov. but with dark-banded tarsi, and with blackish lanceolate scales which appear on the head, thorax, femora and abdomen.

MALE. Wing length 1,05 mm. Head. Black with paler mouthparts and antennae. Eyes closely approximated, bare; back of head and proboscis with scales. Antenna with well developed black plume; segments 11–15 with lengths in proportion of 15–50–35–25–36 including well developed papilla on 15; antennal ratio 0,94. Palpus slightly darker than antenna, 5-segmented; 3rd segment swollen basally with small sensory pit, slightly longer than 4 + 5.

Thorax. Mesonotum, postnotum and scutellum black, latter with about 10 large setae and several smaller ones; thorax with a few scattered lanceolate scales. Wing with costal ratio 0,38; macrotrichia dense except for a small spot just beyond end of costa; no scales present of the type seen elsewhere. Legs yellowish with tibiae spotted (Fig. 24) as in *F. guttata* sp. nov.; unlike that species the tarsi are darkened with narrow light bands across the joints; sharp-pointed scales (as in Fig. 24) present on coxae, trochanters and femora of all legs; tarsal ratios of fore, mid and hind legs are 1,0, 0,78 and 0,94.

Abdomen. Mainly yellow with narrow, irregular, dark apical bands on the terga and with many sharp-pointed scales. Genitalia of a common type; dististyle (Fig. 23) broad basally and narrowing sharply near middle; aedeagus (Fig. 22) shield-shaped, very poorly sclerotized; parameres (Fig. 22) fused basally, the fused part much longer than the width at the base and quite unlike that of *F. guttata* sp. nov.

MATERIAL EXAMINED: Holotype ♂. ZIMBABWE: Harare, St. Ignatius College, ix–x.1984, A. Watsham, light trap. Paratypes 2 ♂, same data but i–ii.1986.

A combination of prominently spotted tibiae, erect, sharp-pointed scales on head, thorax, femora and abdomen, stouter 3rd palpal segment, higher tarsal ratios and pale and dark banded tarsi, distinguish this species readily from *F. guttata* sp. nov. and all other Subsaharan species.

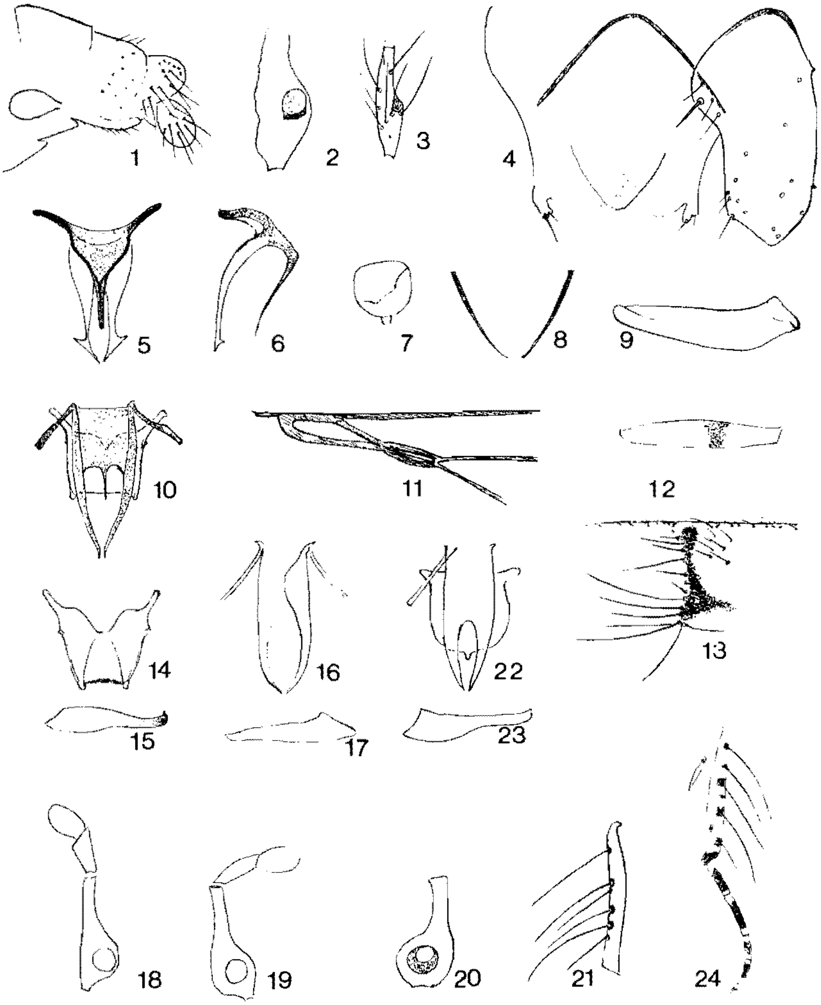


Fig. 1. *Forcipomyia campanula* ♀; distal abdominal segments and spermatheca; 2–9, *F. avocadonis*; 2, 3rd palpal segment of ♀; 3, same of ♂; 4, 9th tergum and basistyle of ♂; 5, aedeagus and parameres, ventral view; 6, same, lateral view; 7, spermatheca; 8, basistylar apodemes; 9, dististyle; 10–15, ♂ *F. castanea*; 10, aedeagus and parameres, ventral view; 11, radial cells; 12, hind femur; 13, abdominal markings, lateral view; 14, aedeagus, ventral view; 15, dististyle; 16–21, *F. guttata*; 16, ♂ parameres, ventral view; 17, ♂ dististyle; 18, 19, ♂ palpal segments 3–5; 20, ♀ palpal segment 3; 21, ♂ hind tibia; 22–24, *F. furfura* ♂; 22, aedeagus and parameres, ventral view; 23, dististyle; 24, hind tibia and tarsus.

Forcipomyia (Forcipomyia) elegans de Meillon & Wirth, Figs 25–26.

Forcipomyia (Forcipomyia) elegans de Meillon & Wirth, 1987: 36.

MATERIAL EXAMINED: New record. ZIMBABWE: Harare, St. Ignatius College, ix–x.1984, A. Watsham, light trap, 4 ♂.

Variation in the intensity of leg markings in *F. biannulata* Ingram & Macfie may cause some difficulty in separating that species from *F. elegans*, as structurally the species are very similar. The dark leg markings are much more extensive in *F. elegans*, however, with the apices of all femora broadly dark, and narrow bases and broad mid-portions of all tibiae, and the tip of the fore femur dark, and all basitarsi also dark. In *F. biannulata* distinct dark markings are confined to the broad distal portion of the hind femur and a narrow subbasal band on the hind tibia. The two species are readily separated by features of the male aedeagus and parameres, which for *F. elegans* are shown in Figs 25–26.

Forcipomyia (Forcipomyia) biannulata Ingram & Macfie, Figs 27–28.

Forcipomyia biannulata Ingram & Macfie, 1924: 557.
Forcipomyia (Forcipomyia) biannulata Ingram & Macfie; Dessart 1963: 45.

DISTRIBUTION: Widespread in Africa, Madagascar, Réunion, Seychelles, Canary Islands.

MATERIAL EXAMINED: New records. BOTSWANA: Maun, ii.1986, V. de V. Clarke, light trap, 1 ♀. ZIMBABWE: Harare, St. Ignatius College, x.1985, ii.1986, A. Watsham, light trap, 3 ♂, 2 ♀.

Notes for the separation of this species from *F. elegans* are given above. The aedeagus and parameres of *F. biannulata* are illustrated in Figs 27–28.

Forcipomyia (Forcipomyia) mcmillani Clastrier & Wirth.

Forcipomyia (Forcipomyia) mcmillani Clastrier & Wirth, 1961: 191.

MATERIAL EXAMINED: New record. ZIMBABWE: Harare, St. Ignatius College, ix–x.1984, ii.1985, A. Watsham, light trap, 2 ♂.

The present record is a significant extension of the range of *F. mcmillani*, previously known from Nigeria. Apart from minor differences in size and tarsal ratios the only major difference from the original description concerns the 3rd palpal segment. In the type of *F. mcmillani* it is said to be thinner than 4 and 5 whereas in the present specimens it is definitely swollen and thicker than the rest.

Forcipomyia (Forcipomyia) vesicula de Meillon & Wirth.

Forcipomyia (Forcipomyia) vesicula de Meillon & Wirth, 1983: 350.

MATERIAL EXAMINED: New record. SOUTH WEST AFRICA (NAMIBIA): Keetmanshoop Dist., Sandmodder, 26°55′ S, 18°55′ E, x.1985, I. Davidson, 2 ♂, 2 ♀.

This species was previously known only from the Augrabies Falls, Gordonia District, Cape Province. The males in the present collection agree in all respects with *F. vesicula*, but the parameres can be sharply pointed as in *F. cirrhosa* Clastrier *et al.* (1961), with which the species was originally compared. The only marked difference in the males of the 2 species is the peculiar development of the spiracular areas on abdominal segments 6–8 in *F. vesicula*. It is possible that this feature may also be present in *F. cirrhosa*, but this has not been recorded and we have not seen type material. The females of *F. vesicula* differ markedly from those of *F. cirrhosa* in the size of the spermathecae which are much larger in *F. vesicula*, measuring 0,322 × 0,155 mm and 0,187 × 0,104 mm. In *F. cirrhosa* they are said to be subequal, each measuring 0,115 × 0,065 mm.

Forcipomyia (Pedilohelea) haroldi sp. nov., Figs 29–33.

MALE. Wing length 1,3 mm. Head. Dark brown dorsally, face and mouthparts paler. Eyes nearly contiguous, bare. Antenna with pedicel dark brown, flagellum pale; segments 4–11 gradually becoming more flask-shaped and narrower, 11 being about twice as long as wide, verticils well developed up to 12; segments 11–15 with lengths in proportion of 10–33–22–16–20, 15 with a parallel-sided papilla 4 units long (Fig. 29). Palpus 4-segmented; 3rd segment very slightly swollen basally, no sensory pit, slightly longer than 4+5.

Thorax. Uniformly dark brown including pleuron, postnotum and scutellum; latter with 12 setae; mesonotum with scattered setae, none of which, judging by the sockets, are strong or large, even above wing roots. Wing damaged during mounting procedure; costal ratio less than 0,5; 1st radial cell absent, 2nd small but open. Legs paler than thorax, unarmed and not swollen; fore tibia with short subapical comb of very fine teeth and apical blade-like spur as long as width of tibia; hind tibia with minute apical spur, apical row of 6 small setae; hind basitarsus with a long, fairly strong seta near apex; tarsal ratios of fore, mid and hind legs are 0,6, 0,4, and 0,4; claws simple, empodium well developed.

Abdomen. Dark brown, apex not darkened. Genitalia (Figs 30–33): 9th segment lightly sclerotized, very broad, base and apex narrower; distal margin of 9th sternum nearly straight; 9th tergum with apical 4th transparent, without strongly developed apicolateral processes (Fig. 30); in side view (Fig. 32) it is seen that the translucent portion arises from the inner margin of the basal portion; basistyle slightly more than twice as long as wide, without any pronounced projections from inner base; dististyle strongly sinuous (Fig. 31); aedeagus (Fig. 33) with transparent shield-shaped distal portion reaching to apex of parameres, placed on a very strongly sclerotized base as shown; parameres (Fig. 30) fused basally, with distal half of 2 strong, black, spine-like processes which might be separate, if connected then by a transparent membrane not visible in the only specimen available.

MATERIAL EXAMINED: Holotype ♂. SOUTH AFRICA: Transvaal, Silver Leaves, Tzaneen, viii.1984, in Cross emergence trap, M. Klapwyk.

The species is named for Harold Cross of the National Institute for Tropical Diseases, Tzaneen. Harold constructed the trap which has yielded so many new and interesting specimens of Ceratopogonidae. The species is closely related to *F. eshowensis* de Meillon (1937) but differs in the male genitalia as follows:

	haroldi	*eshowensis*
aedeagus	length 1,2 × width across basal arms which are short	length 2 × width across basal arms which are long
parameres	fused on basal half	clearly separated except at extreme bases
dististyle	markedly sinuate	nearly straight

Forcipomyia (Pedilohelea) eshowensis de Meillon.

Forcipomyia eshowensis de Meillon, 1937: 361.
Forcipomyia (Pedilohelea) eshowensis de Meillon; de Meillon & Wirth 1980: 18.

DISTRIBUTION: Zululand, South Africa; Ghana, West Africa.

MATERIAL EXAMINED: New record. SOUTH AFRICA: Cape Province, Stormsrivier, Goesabos, 5–30.xii.1981, S. & J. Peck, 1 ♂.

Forcipomyia (Thyridomyia) Saunders

To date 10 species of this subgenus have been described from the Subsaharan Region. A key for their identification was given by de Meillon & Wirth (1981). Of these, the females of *F. tugelensis* de Meillon (1959) and *F. skiaphila* (Clastrier, 1960) are unknown. We here give a new record for *F. frutetorum* (Winnertz) and describe two new species.

Forcipomyia (Thyridomyia) frutetorum (Winnertz), Figs 34, 36–37

Ceratopogon frutetorum Winnertz, 1852: 29.
Thyridomyia frutetorum (Winnertz); Saunders 1925: 275.
Forcipomyia (Thyridomyia) frutetorum (Winnertz); Saunders 1956: 695, Dow & Wirth 1972: 180.

DISTRIBUTION: Europe, North America, widespread in Africa.

MATERIAL EXAMINED: New record. ZIMBABWE: Harare, St. Ignatius College, ix–x.1984, i, ii, iv, ix.1985, A. Watsham, light trap, 12 ♂, 4 ♀.

Figures 34, 36–37 of the 3rd palpal segment, aedeagus and dististyle are presented for comparison with the following two new species.

Forcipomyia (Thyridomyia) gokwe sp. nov., Figs 35, 38.

A dark brown species with slightly paler scutellum, legs and abdomen; belonging to the *F. frutetorum* group of species.

MALE. Wing length 0,94 mm. Head. Dark brown with mouthparts, palpi and antennal flagellum paler. Eyes narrowly separated, bare. Antennal segment 3 with a long stalk, 4th round, 5–11 gradually lengthening and decreasing in width, 11 being about 1,5 times as long as wide in middle; 7–9 fused as in *F. frutetorum*; 12–15 with lengths in proportion of 53–32–24–25 not including papilla on 15; antennal ratio 0,90. Palpus with segments 4 and 5 partially fused; 3rd slightly and evenly swollen in midportion, without discernible sensory pit (Fig. 35).

Thorax. Dark brown to black; scutellum slightly paler, with 8 large setae. Wing uniformly dark due to dense microtrichia, macrotrichia fairly dense with some bare lines along veins; costal ratio 0,54; 1st radial cell a mere slit, 2nd open and large measuring internally 0,078 mm. Legs uniformly light brown; hind tibia with subapical transverse comb of about 12 short, fairly strong teeth, an apical row of 7–8 long setae, and a long narrow spine-like apical spur; tarsal ratios of fore, mid and hind legs are 2,7, 2,5 and 3,0; empodium absent.

Abdomen. A shade paler than thorax. Genitalia (Figs 37, 38) of the *F. frutetorum* type but lateral sclerites of the aedeagus much broader and basal arms shorter.

MATERIAL EXAMINED: Holotype ♂, ZIMBABWE: Gokwe Area, i.1981, R. J. Phelps. Paratype ♂, BUKINA FASO [UPPER VOLTA], A.O.F.: Karankasso, Cercle Boso Digulasso, 1.x.1956, J. Hamon, (Office de la Recherche Scientifique et Technique Outre-Mer).

The structure of the 3rd palpal segment, without a sensory pit, and the genitalia readily serve to identify this species and separate it from others in the *F. frutetorum* group. The precise relationships between the central part of the aedeagus and the lateral arms are not very clear; it would take dissection of unmounted specimens to resolve this problem in all members of the group.

Forcipomyia (Thyridomyia) watshami sp. nov., Figs 39–40.

A member of the *F. frutetorum* group of species, differing mainly in the structure of the male genitalia.

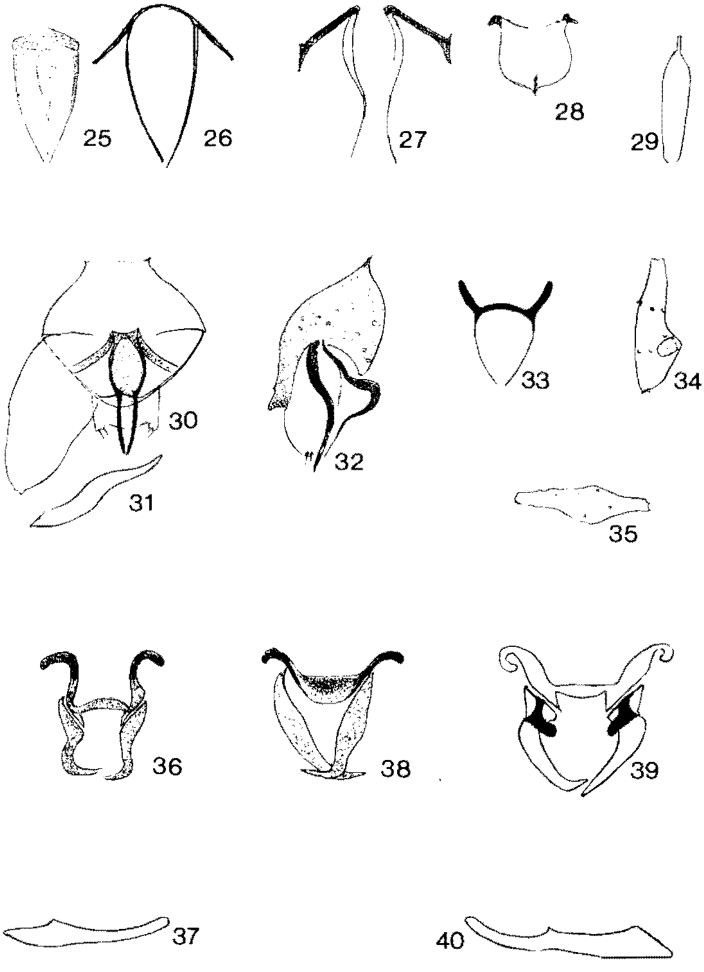
MALE. Wing length 0,97 mm. Head. Eyes narrowly separated, bare. Antenna with segments 7–9 partially fused; 12–15 with lengths in proportion of 10–5–3–5 plus papilla, antennal ratio 0,9. Palpus as in *F. gokwe* sp. nov., 3rd segment with indistinct indication of a sensory pit, segments 4–5 incompletely fused.

Thorax. Scutellum with about 10 setae. Wing with costal ratio 0,45. Legs with tarsal ratios of fore, mid and hind legs 2,2, 1,8, and 2,0; tibial combs much as in *F. gokwe*, tibial spur shorter than apical width of tibia.

Abdomen. As usual a shade paler than thorax. Genitalia (Figs 39–40) as in other members of the *F. frutetorum* group, differing in the development of the base of the lateral sclerites of the aedeagus where they meet the basal bridge (Fig. 39); this development consists of a blunt, sclerotized, thumb-like extension inwardly; lateral sclerites short and thick much as in *F. gokwe*; an outstanding feature is the development of the dististyle (Fig. 40) which bears a small tooth on inner margin slightly more than half-way (0,6) to apex.

MATERIAL EXAMINED: Holotype ♂, paratype ♂. ZIMBABWE: Harare, St. Ignatius College, ix-x.1984, A. Watsham, light trap.

The species is readily separated from others in the Subsaharan Region by the structure of the male genitalia. It is named for Fr. A. Watsham of St. Ignatius Loyola College, Harare, Zimbabwe, for his continued assistance in collecting Ceratopogonidae.



Figs 25–26. ***Forcipomyia elegans*** ♂; 25, aedeagus; 26, parameres; 27–28, ***F. biannulata*** ♂; 27, parameres; 28, aedeagus; 29–33, ***F. haroldi*** ♂; 29, antennal segment 15; 30, 9th segment, basistyle and parameres; 31, dististyle; 32, 9th segment, aedeagus and parameres, lateral view; 33, aedeagus; 34, ***F. frutetorum*** ♂, palpal segment 3; 35, same, ***F. gokwe*** ♂; 36–37, ***F. frutetorum*** ♂; 36, aedeagus; 37, dististyle; 38, ***F. gokwe***, ♂ aedeagus; 39–40, ***F. watshami*** ♂; 39, aedeagus; 40, dististyle.

Forcipomyia (Trichohelea) consortis sp. nov., Figs 41–49.

A small brown to dark brown species, the female being darker than the male; typical of the subgenus without any distinctive ornamentation; denuded probably because of the method of capture.

MALE. Wing length slightly less than that of female, wing damaged. Head. Dark brown dorsally, face paler. Eyes broadly contiguous, bare. Antenna (Fig. 42) with pedicel dark brown, flagellum paler; segment 3 with a long stalk, 4 about as long as wide, 5–11 gradually narrowing and becoming vasiform, 11 about twice as long as wide; segments 10–15 with lengths in proportion of 14–15–43–31–23–30 including knob-like terminal papilla; plume well developed on 4–12. Palpus (Fig. 44) brown; 5-segmented; 3 as long as 4+5, slightly swollen near middle, a circular sensory organ with no depth at midlength.

Thorax. Uniformly dark brown except for paler scutellum, latter with 8 large alveoli (seta bases); some similar alveoli above wing roots and along border of mesonotum. Wing (Fig. 41) unicolorous, macro- and microtrichia not dense; 1st radial cell not developed or a mere slit, 2nd large and well formed; costal ratio 0,49. Legs mainly light brown and unicolorous; apex of fore tibia with patch of strong setae followed by a short comb of very fine, closely set teeth which could not be counted because of small size; apical spur a hyaline, nearly straight spine about as long as tibia is wide, tarsal ratio a little over 2,0; claws equal, simple; empodium not developed. Mid leg tarsal ratio 1,68; hind tibia with subapical comb of 8 strong, short spines and an apical row of 5 long setae, apical spur as on fore leg; tarsal ratio 2,1, otherwise as on fore and mid legs.

Abdomen. Uniformly light brown including genitalia. Genitalia (Figs 46–47) typical of subgenus; parameres joined in shape of a thick-walled, broad, shallow, U-shaped structure; aedeagus (Fig. 47) shield-shaped with a long, distal, transparent, triangular extension which runs to an ill-defined apex; 9th segments, basistyle and dististyle as figured, latter somewhat sword-shaped.

FEMALE. Slightly darker than male. Wing length 1,17 mm.

Head. Colour and eyes as in male; mandible broad, apically rounded, teeth small and could not be counted. Antenna (Fig. 43) with segments 4–8 subglobular, 9–10 a shade narrower and longer than broad; lengths of segments 10–15 in proportion of 14–29–30–28–25–35 including knob-like terminal papilla. Palpus (Fig. 45) 5-segmented; 3rd segment as in male but slightly more swollen.

Thorax. As in male but scutellum apparently with more numerous strong setae. Wing as in male but wider, radial cells as in male; costal ratio 0,57; macro- and microtrichia denser than in male but as in that sex denuded. Legs with colour as in male; tibial combs and spurs as in male; tarsal ratios of fore, mid and hind legs are 2,6, 2,8, and 3,0; claws unmodified, equal and simple, empodium well developed.

Abdomen. Genital sclerotization very slight, but forming a faint shield-like area (Fig. 49). Spermathecae (Fig. 48) 2, sclerotized, globular with short necks; measuring 0,073 × 0,057 mm and 0,062 × 0,047 mm including necks.

MATERIAL EXAMINED: Holotype ♂, allotype ♀, paratype ♀. SOUTH AFRICA: Cape Province, Knysna, Diepwalle, 12–30.xii.1981, S. & J. Peck, malaise trap in forest.

In the key by Lane (1977) to the African *Trichohelea* species, *F. consortis* keys out closest to *F. geometrica* (Clastrier 1959) from Réunion, but that species differs in having small stout female claws, more elongate distal antennal segments, more elongate spermathecae, and costal ratio 0,59.

Subfamily DASYHELEINAE

Genus *DASYHELEA* Kieffer

Dasyhelea atra sp. nov., Figs 50–54.

A large, uniformly black species; legs with long hairs; wing with radial cell large, open, macrotrichia over whole surface but not very dense; legs without any definite banding but fore femur and tibia with a faint preapical darker patch, mid femur likewise, hind femur all dark; tarsi a shade paler.

MALE. Wing length 1,47 mm. Head. Dark brown to black. Antenna dark brown to black, sculptured, plume heavy; segments 11–15 with lengths in proportion of 10–25–21–17–22 including terminal papilla. Palpus dark; lengths of segments in proportion of 15–30–15–22; 3rd segment parallel-sided.

Thorax. Dark brown to black throughout; setae on scutellum could not be determined; fore tibia (Fig. 50) with a preapical row of 5–6 long, strong setae, just beyond which is a comb of numerous very fine teeth which extend well beyond end of tibia; no apical spine could be detected. Hind tibia with preapical comb of short strong teeth followed by an apical row of 5 long setae, apical spur simple and spine-like, shorter than width of tibia. All legs with numerous short setae and very long, hair-like bristles on posterior border, short setae somewhat stouter on hind basitarsus (Fig. 51). Wing with costal ratio 0,49.

Abdomen. Dark brown to black. Genitalia (Figs 52–54) black, strongly sclerotized though small.

MATERIAL EXAMINED: Holotype ♂. ZIMBABWE: Harare, St. Ignatius College, ix–x.1984, A. Watsham, light trap.

This species closely resembles *D. tugelae* de Meillon (1936) but the distal process of the male paramere has bluntly rounded apex.

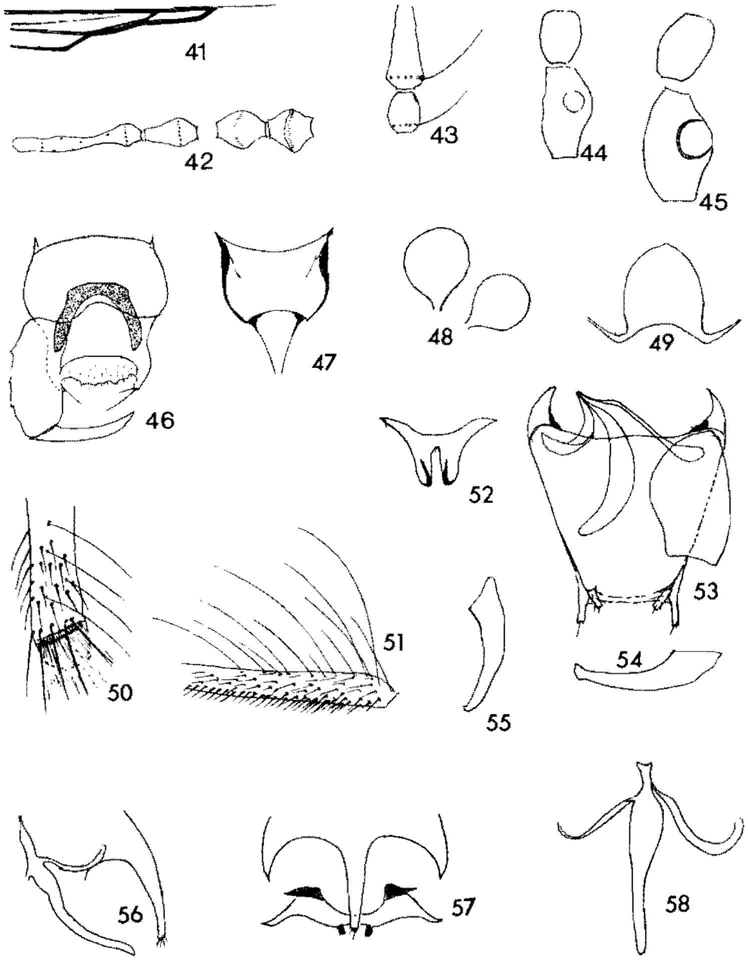
Dasyhelea columna sp. nov., Figs 55–58.

A dark brown to black species without any distinctive markings, legs paler. Male genitalia with distal margin of 9th sternum produced into a strong pillar-like projection, hence the name.

MALE. Wing length 0,70 mm. Head. Black; face, mouthparts and antennae paler. Antenna not clearly sculptured; segments 4–11 gradually narrowing, 11 being slightly longer than broad; segments 11–15 with lengths in proportion of 10–23–25–20–20 with very slight variation in the 3 specimens; 15 without terminal papilla. Palpus pale; segment 3 parallel-sided.

Thorax. Dark brown to black; scutellum clear yellow, with 4 setae in midportion and 1 lateral on each side. Wing without discernible radial cells; macrotrichia normal; costal ratio 0,50. Legs paler than thorax and without any distinctive markings; hind tibia and basitarsus with long thin hairs on posterior border; subapically hind tibia with a transverse comb of about 12 short stout teeth and an apical row of 5–6 black setae, no well-defined apical spur.

Abdomen. Slightly paler than thorax. Genitalia (Figs 55–58) moderately sclerotized; 9th sternum produced medially into a long, strong, rigid column which gradually narrows to a blunt, hairy point extending beyond tip of parameres (Fig. 57); 9th tergum evenly rounded distally without any marked apicolaterals; basistyle and



Figs 41–49. *Forcipomyia consortis*; 41, radial cells, ♂; 42, antennal segments 4–5, 10–11, ♂; 43, antennal segments 10–11, ♀; 44, palpal segments 3–4, ♂; 45, same, ♀; 46, 9th segment, basistyle, dististyle and parameres, ♂; 47, ♂ aedeagus; 48, spermathecae; 49, ♀ genital sclerotization; 50–54, *Dasyhelea atra* ♂; 50, apex hind tibia; 51, hind basitarsus; 52, aedeagus; 53, 9th segment, basistyle and parameres; 54, dististyle; 55–58, *D. columna* ♂; 55, dististyle; 56, aedeagus and 9th sternum, lateral view; 57, same, ventral view; 58, parameres.

diststyle without any unusual features; aedeagus of the type usually seen in the genus (Fig. 57); paramere with a long median process slightly swollen basally as figured (Fig. 58); shown in side view in Fig. 56.

MATERIAL EXAMINED: Holotype ♂. ZIMBABWE: Burma Valley, Matanuska, 12.iii.1971, V. de V. Clarke. One ♂ paratype, Uzumbe, Kateyo, 17.iii.1970, R. J. Phelps. One ♂ paratype, Harare, St. Ignatius College, ix.1985, A. Watsham, light trap.

The rigid elongated process of the 9th sternum is unique and makes this species easily recognizable.

Dasyhelea forficata sp. nov., Figs 59–64.

The male, typical of the genus, is easily recognized by the diststyle which is shaped like a pair of open shears (Fig. 59). At low magnification the one blade of the shears projects at right angles from the basistyle and the other blade rests against the 9th tergum and is not readily visible (Fig. 60). In addition, the 9th sternum is highly modified as shown (Figs 61–62).

MALE. Wing length 0,60 mm. Head. Dark brown to black. Antenna lightly sculptured, apical 4 segments elongated, 11–15 with lengths in proportion of 12–20–20–15–23. Palpus with 3rd segment slightly swollen.

Thorax. Uniformly dark brown but scutellum with a narrow paler border and 5 large setae. Wing unmarked, costal ratio 0,45; radius and costa slightly darkened, square-ended with a single small radial cell; posterior veins not well defined; a few macrotrichia near apical margin from end of costa to about end of vein M1. Legs paler than thorax, unarmed, not swollen; fore tibia with a subapical transverse comb of short setae and an apical row of 8 long subequal setae; apical spur short and spine-like; 4th tarsomeres parallel-sided and nearly as long as 5th which bears rather delicate, narrow, only slightly curved, equal and simple claws.

Abdomen. Slightly paler than thorax except apically where sclerotized. Genitalia (Figs 59–63) well sclerotized, under low magnification appearing to have sharply pointed apicolateral processes (Fig. 60); when more closely examined after some probing with needles, it is seen that the 'apicolateral processes' are in fact 1 blade of a scissors-like diststyle (Fig. 59). Ninth sternum strongly modified on its caudomedian excavation with a median carina which is drawn out to a strong central point from the rear of which extend 2 strongly sclerotized horns (Fig. 61); as far as could be ascertained these are part of the sternum and could not be dislodged; this is also evident in side view (Fig. 62); 9th tergum poorly developed, narrowed and rounded on apical half; as if to make up for this weakness the basistyles are very strongly buttressed medioventrally and excavated at the apex to bear the diststyles (Fig. 59); parameres fused, consisting of a transverse sclerotized sinuous bar bearing at its midpoint a totally colourless median curved process. which is difficult to see (Fig. 63); aedeagus (Fig. 59) a highly sclerotized crossbar as seen in many species.

FEMALE. Wing length 0,61 mm. Colour as in male. Head. Antenna short, only 1/5 longer than width of head across the eyes; segments not clearly sculptured; segments 4–10 globular, 11–14 slightly longer than broad, 15 about twice as long as broad. Palpus poorly defined and almost totally transparent; segment 3 globular; pharynx with its long, outwardly directed cornua as described by de Meillon (1937) for *Dasyhelea* but with a pigmented collar basally. The male described above has a similar type of pharynx.

Thorax. As in male, scutellum bearing 5 long setae and with a pale border. Wing with costal ratio 0,45; radius, costa and posterior veins as in male; macrotrichia denser but still restricted to margin. Legs as in male.

Abdomen. Ninth tergum well sclerotized, tapering laterally to slender arms; terminal sterna very pale with precise structure not discernible except for a very small but highly sclerotized pair of L-shaped bodies as shown in Fig. 64. Spermatheca (Fig. 64) highly sclerotized, more or less globular and measuring 0,039 mm in diameter.

MATERIAL EXAMINED: Holotype ♂, allotype ♀. SENEGAL, E.C.A.: Buzo, Piege, 25–30.vii.1978, J. P. Hervé, UV light trap.

The male of this species resembles *D. flava* Carter, Ingram & Macfie (1921) in having each dististyle consisting of 2 blades, but in *D. flava* these are very dissimilar (see figures in Clastrier, 1959); the modifications of the 9th sternum are also dissimilar in the two species. The female, as in the male, is very dark and does not match the 'canary colour' of *D. flava*. The spermatheca is very similar to that of *D. flava*, but in that species the two L-shaped sclerites are not present and could hardly have been missed.

Dasyhelea furcula sp. nov., Figs 65–69.

A small, uniformly blackish species typical of the genus in general appearance.

MALE. Wing length 0,92–1,04 mm. Head. Antenna with plume black; sculpturing prominent; segments 3–7 subglobular, 8–11 each with a short stalk, 12–15 elongated; 11–15 with lengths in proportion of 7–22–19–13–12. Palpus (Fig. 69) very long and slender, 3rd segment very slightly expanded basally.

Thorax. Mesonotum, pleuron and postnotum very dark, blackish; scutellum in contrast yellow, with 6–8 long strong setae. Wing typical of the genus, costal ratio just under 0,5; costa square-ended with a definite radial cell. Legs paler than thorax, without any strong spines or other distinctive features; fore tibia with a poorly-developed, short, apical comb of very fine teeth, an apical spur could not be identified with certainty; hind tibia with a subapical comb of short, strong teeth and an apical row of 6 strong subequal setae, as on the fore tibia apical spur not developed, or if so, then small and not obvious.

Abdomen. Blackish, terminal segments not much darker. Genitalia (Figs 65–68) with 9th sternum large, covering the aedeagus, distal border strongly produced, divided medially in the shape of a pair of pointed lobes (Fig. 65); 9th tergum more or less square-ended with very small apicolateral processes; aedeagus (Fig. 67) as seen in some species, it had to be dissected out from the 9th segment before its true nature became evident; parameres of common type, but strongly split (Fig. 68); basistyle and dististyle (Fig. 66) normal, the latter without a basal barb as described for *D. leporis* de Meillon & Wirth (1981).

MATERIAL EXAMINED: Holotype ♂, 5 ♂ paratypes. SOUTH AFRICA: Transvaal, Silver Leaves, Tzaneen, 26.ix.1984, M. Klapwyk, taken in a Cross emergence trap.

The character of the 9th sternum is quite peculiar to this species and together with the divided paramere makes it easy to recognize. Two other species in which the parameres are forked distally are *D. leporis* and *D. fenerivensis* de Meillon (1961). The former, with its very long apicolateral processes of the 9th tergum and the peculiar process at the base of the dististyle is easily recognized. *D. fenerivensis* lacks both of these characters, but the paramere is briefly forked apically.

Dasyhelea hamata sp. nov., Figs 70–73.

As usual in the genus without any marked external features; mostly dark brown to black. Aedeagus with a pair of hooks at each corner, hence the specific name.

MALE. Wing length 1,1 mm. Head. Dark brown to black; interocular space not pigmented. Antenna with light sculpturing; a shade paler than top of head; segments 11–15 with lengths in proportion of 11–25–28–26–25; 15 slightly collapsed, hence could be longer, no apical papilla. Palpus transparent; 3rd segment very slightly swollen.

Thorax. Dark brown to black, except for pale yellow shoulders and scutellum, latter with 6 long setae. Wing somewhat disfigured during remounting of the slide, but typical of many species with a single radial cell and sparsely clad with macrotrichia; costal ratio 0,54. Legs paler than thorax and abdomen, without any marked banding; hind tibia (Fig. 70) with a comb of strong teeth subapically and a row of 5 setae apically; there is no clearly defined apical spur but a pair of rather short, stout, colourless setae or spines may serve the same purpose; fore tibia apically without any discernible comb or row of setae.

Abdomen. Dark brown dorsally, paler ventrally. Genitalia (Figs 71–73) with 9th sternum with posterior margin straight or slightly concave, 9th tergum with rather long, parallel-sided apicolateral processes (Fig. 71); basistyle normal, longer than broad and without any internal projections; dististyle (Fig. 72) unusual in bearing a short, sharp, triangular piece apparently inserted at its apex; parameres (Fig. 73) asymmetrical, consisting of a long, thin sclerite reaching to the apex of the basistyle (Fig. 73); aedeagus a broad plate bearing at each distal angle a pair of strong curved hooks (Fig. 73).

MATERIAL EXAMINED: Holotype ♂. ZIMBABWE: Rokoneshe, xi.1973, R. J. Phelps.

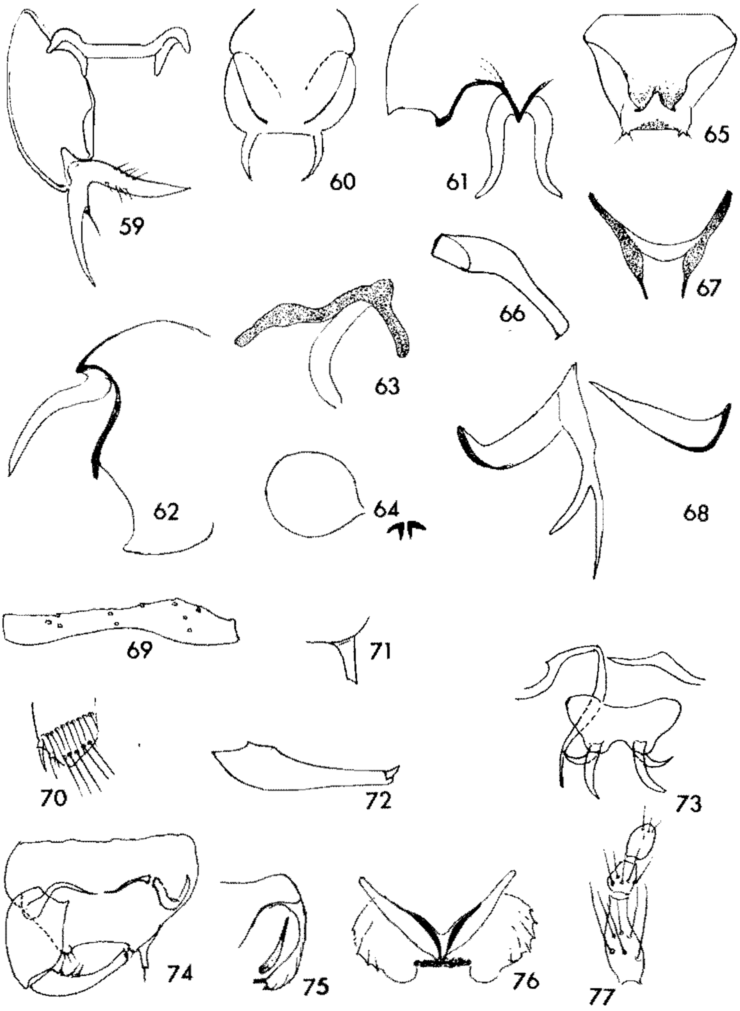
Two outstanding features, namely the aedeagus with its hooks, and the dististyle apex as figured, make this species easily recognizable.

Dasyhelea imperfecta sp. nov., Figs 74–77.

A uniformly dark brown to black species with paler legs which do not carry any excessively long slender hairs.

MALE. Wing length 0,94 mm. Head. Black with face and mouthparts paler. Antenna with pedicel black, 3–14 light brown; poorly sculptured, with well-developed black plume; 4–11 as usual spherical to subspherical, gradually narrowing, 11 being slightly longer than broad; lengths of 12–15 in proportion of 31–35–25–25; 15 without terminal papilla. Palpus light brown; lengths of segments 3–5 in proportion of 23–13–13; segments 2–5 all slightly swollen (Fig. 77), 3 with a sensory area on inner side near midlength.

Thorax. Uniformly dark brown to black; scutellum with 2 long medial setae and 1 on each end. Wing with costal ratio 0,50; denuded but a few very narrow scales remaining; 2 radial cells present, 1st very narrow, 2nd wider, rather well defined. Legs mainly light brown, slender and bearing long curved hairs along extensor margin of segments; fore tibia without apical comb or spur; hind tibia with subapical comb of 15 short, dark and rather stout teeth and an apical row of 6 setae, apical spur could not be identified.



Figs 59–64. *Dasyhelea forficata*; 59, aedeagus, basistyle and dististyle, ♂; 60, dorsal profile of ♂ genitalia; 61, ♂ 9th sternum; 62, ♂ 9th segment, lateral view; 63, parameres; 64, ♀ spermatheca; 65–69, *D. furcula* ♂; 65, 9th segment, ventral view; 66, dististyle; 67, aedeagus; 68, parameres; 69, 3rd palpal segment; 70–73, *D. hamata* ♂; 70, hind tibial comb; 71, apicolateral process of 9th tergum; 72, dististyle; 73, aedeagus and parameres; 74–77, *D. imperfecta* ♂; 74, genitalia, ventral view, aedeagus omitted; 75, aedeagus and 9th sternum, lateral view; 76, same, ventral view; 77, palpal segments 3–5.

Abdomen. Dark brown, especially apically. Genitalia (Figs 74–76) small, not strongly sclerotized; 9th segment wider than long, tergum with long apicolateral processes; basistyle and dististyle normal, latter with 3 setae on raised tubercles near inner base (Fig. 74); aedeagus in ventral view (Fig. 76) seen to have a slightly crenulated bulbous structure on each side; however, in side view (Fig. 75) it is seen that these structures plus the sclerotized bar are really extensions of the 9th sternum. Apodemes consist of a pair of undulating, slender, sharply pointed sclerites which do not quite meet in middle, the sclerite on the left hand side (viewed ventrally) has a sharp break about midway and since no paramere was detectible the detached part might well be the remains of the paramere (Fig. 74); the aedeagus consists of a pair of widely based arms meeting at a point adjacent to the sclerotized crossbar of the sternum.

MATERIAL EXAMINED: Holotype ♂. ZIMBABWE: Harare, Lake McIlwaine, viii.1980, R. J. Phelps, sticky trap.

The unusual development of the 9th sternum and absence of a definite paramere make this species easily recognizable.

Dasyhelea soutini de Meillon & Wirth.

Dasyhelea soutini de Meillon & Wirth, 1987: 38.

MATERIAL EXAMINED: New record. SENEGAL: Region Orientale, Ngari Kedougou, v.1975, M. Cornet, light trap, 3 ♂. Previously known only from the Transvaal.

Dasyhelea tibestiensis Clastrier, Rioux & Descous.

Dasyhelea tibestiensis Clastrier, Rioux & Descous, 1961: 61

MATERIAL EXAMINED: New record. ZIMBABWE: Kariba, x-xi.1967, xi.1968, D. R. Birkenmeyer, UV light trap, 7 ♂.

Except for small and insignificant differences in size the males reported here agree in all important characters with *D. tibestiensis*, formerly known only from N. Tchad, West Africa.

Dasyhelea waldiae Macfie.

Dasyhelea waldiae Macfie, 1937: 77.

MATERIAL EXAMINED: New record. SOUTH AFRICA: Transvaal, Silver Leaves, Tzaneen, 18.vii-11.ix.1984, M. Klapwyk, in Cross emergence trap, 1 ♂. Previously known from Ethiopia.

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